

THE UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER 2013

B. Sc. IV

TITLE OF PAPER : APPLIED SOIL SCIENCE

COURSE NUMBER : GEP 433

TIME ALLOWED : THREE [3] HOURS

INSTRUCTIONS : ANSWER QUESTION ONE [1] WHICH IS
A COMPULSORY QUESTION AND ANY
TWO [2] QUESTIONS OF YOUR
CHOICE

MARKS ALLOCATED : QUESTION ONE [1] CARRIES FORTY
[40] MARKS AND THE OTHER
QUESTIONS CARRY THIRTY [30]
MARKS EACH.

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GRANTED BY THE CHIEF INVIGILATOR.

SECTION A: COMPULSORY QUESTION

QUESTION 1

a) Give brief definitions of the following terms and phrases:

- i) Edaphology [3]
- ii) Pedology [3]
- iii) Soil [3]
- iv) Soil structure [3]
- v) Soil texture [3]

b) Discuss the following soil forming factors:

- i) Organisms [5]
- ii) Climate [5]
- iii) Time [5]
- iv) Topography [5]
- v) Parent material [5]

[40]

SECTION B

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 2

The weathering process is said to be the most important precursor of soil development among the known pedogenic soil forming processes. Identify and discuss the main points of this process in the context of soil formation.

[30]

QUESTION 3

Discuss in detail the mechanisms that bring about the formation of the following parent materials including the characterization of such materials.

- i) Loess [10]
- ii) Colluvium [10]
- iii) Alluvium [10]

[30]

QUESTION 4

a) Briefly discuss the following master horizons and indicate their significance to the development of a pedon

- i) The A-horizon [5]
- ii) The C-horizon [5]
- iii) The R-horizon [5]

b) Discuss the manner in which the B and E horizons develop, paying particular attention to the processes involved. [15]

[30]

QUESTION 5

Discuss the applications of soil survey in sparsely settled or empty areas under the following topics:

- a) Project feasibility [6]
- b) Resource inventory and project location [8]
- c) Project planning [8]
- d) Purpose of a soil survey [8]

[30]